

REMARKS

Election/Restriction

The Examiner has withdrawn newly submitted claims 208-220 as being directed to an invention that is independently distinct from the invention originally claimed. It is the Examiner's position that newly submitted claims do not recite a method for processing individual wafer and comprise limitations that are not required by the previously presented claims. Applicant has amended new claims 208-220 to indicate that they recite an apparatus for processing individual wafers. Additionally, it is Applicants understanding that new claims 208-220 contain only limitations which can be found in previously presented claims 1-3, 5-16, 18, 19, 22-25, 45, 45 and 52. As such, Applicant respectfully requests the Examiner to enter new claims 208-220.

Claim Rejections - 35 U.S.C. § 112

The Examiner has rejected claims 1-16, 18, 19, 22-25, 45, 46 and 52 under 35 U.S.C. § 112 second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. Applicant has amended claims 1-3, 5-16, 18, 19, 22-25, 45, 46 and 52 to more particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claim Rejections - 35 U.S.C. §§ 102/103

The Examiner has rejected claims 1-11, 15, 18, 22-25 and 105-108 under 35 U.S.C. § 102(b) as being anticipated by Bergman et al. (US Patent 5,235,995). The Examiner has rejected claims 1-5, 8-15, 18, 19, and 22 under 35 U.S.C. § 102(a) as being anticipated by Busnaina (WO 0021692). The Examiner has rejected claims 6, 7, 45-46 and 105-108 under 35 U.S.C. § 103(a) as being unpatentable over Busnaina (WO 0021692) in view of Bergman et al. (US Patent 5,235,995), Akatsu et al. (US Patent 6,021,789) and Ohmi et al. (Advanced Wet Cleaning Technology for Next Generation FPD Manufacturing). The Examiner has rejected claims 16, 20, and 21 under 35 U.S.C. § 103(a) as being unpatentable over Busnaina (WO 0021692).

In claims 1-3, 5-16, 18, 19, 22-25, 45, 46 and 52, Applicant teaches and claims an apparatus for the wet processing of a device side of an individual wafer. Applicant's apparatus includes means for applying acoustic energy and means for holding a wafer above the acoustic means. The means for holding the wafer positions the wafer so that the surface of the wafer to be processed (e.g., the device side) is located away from the acoustic energy source and the opposite surface of the wafer (e.g., the non-device side) is located near or adjacent to the acoustic wave source. Applicants further claims means for flowing a first liquid between the acoustic energy source and the surface opposite (e.g., non-device side), the surface to be processed (device side). The purpose of the liquid is to provide a medium to transmit the acoustic energy from the transducers to the wafer. Applicants further claim means for flowing a processing liquid (e.g., cleaning chemicals) onto the wafer surface (e.g., device side) which is to be processed. Thus, Applicants teach and claim an apparatus whereby acoustic energy is directed towards the wafer surface (e.g., non-device side) opposite to the surface which is to be processed (e.g., device side).

By applying acoustic waves to the non-device side of the wafer, the acoustic waves first strike the wafer non-device side wherein no devices exist that could be damaged by the full force of the acoustic energy. In this way, fragile thin film features, such as polysilicon lines formed on the device side are not damaged by the full force of the acoustic waves which impact the wafer non-device side (backside). As the waves travel through the wafer, they are dampened but still have sufficient energy to provide cavitation in the cleaning solution on the frontside of the wafer to enhance optimal cleaning without damaging the fragile devices on the wafer frontside.

Accordingly, Applicant teaches and claims an apparatus where the acoustic energy is directed towards the wafer surface opposite to the surface which is to be processed or cleaned. Each of the cited references specifically describes applying megasonics energy directly to the side to be processed. Accordingly, each of the cited references not only fails to teach Applicant's invention, but in fact, teaches away from Applicant's invention as they teach applying megasonics energy directly to the surface of the wafer to be processed or cleaned.

It is Applicants understanding that Bergman et al. describes a processing machine 10 which includes a processing head 12 which includes a wafer holder 30 which holds the wafer processing surface face down towards a pool 40. An ultrasonic agitator 75 is applied to the pool 40 to agitate and have vapor phase formation. The vapor phase is then presented for contacting and etching the process surface of the wafer. Thus, Bergman et al. clearly describes applying acoustic energy towards the surface of the wafer to be processed and not the opposite surface as claimed by Applicant.

It is Applicants understanding that Busnaina describes a single wafer megasonics cleaning apparatus 200 as illustrated in Figures 2 and 3. The apparatus

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PETITION FOR EXTENSION OF TIME
PURSUANT TO 37 C.F.R. § 1.136 (a)

Applicant respectfully petitions pursuant to 37 CFR § 1.136(a) for a two-month extension of time to file this response to the Final Office Action mailed March 23, 2005 and Notice of Appeal filed August 23, 2005. The extended period is set to expire on December 23, 2005. A check in the amount of \$450.00 is enclosed to cover the fee for a two-month extension of time.

Pursuant to 37 C.F.R. 1.136(a)(3), applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, to Deposit Account No. 02-2666.

Respectfully submitted,

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